

A photograph of a forest fire. Bright orange and yellow flames are visible rising between the trunks of tall, thin trees. Some trees in the foreground are green, while others are charred or have lost their needles. The scene is dramatic and illustrates the impact of fire on a forest ecosystem.

"History of Fire Regime Groups and Condition Classes

Fire Regime

The Frequency and
Effect of Fire Occurrence



USDA United States
Department
of Agriculture

Forest Service

Rocky Mountain
Research Station

General Technical
Report RMRS-87

April 2002



Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management

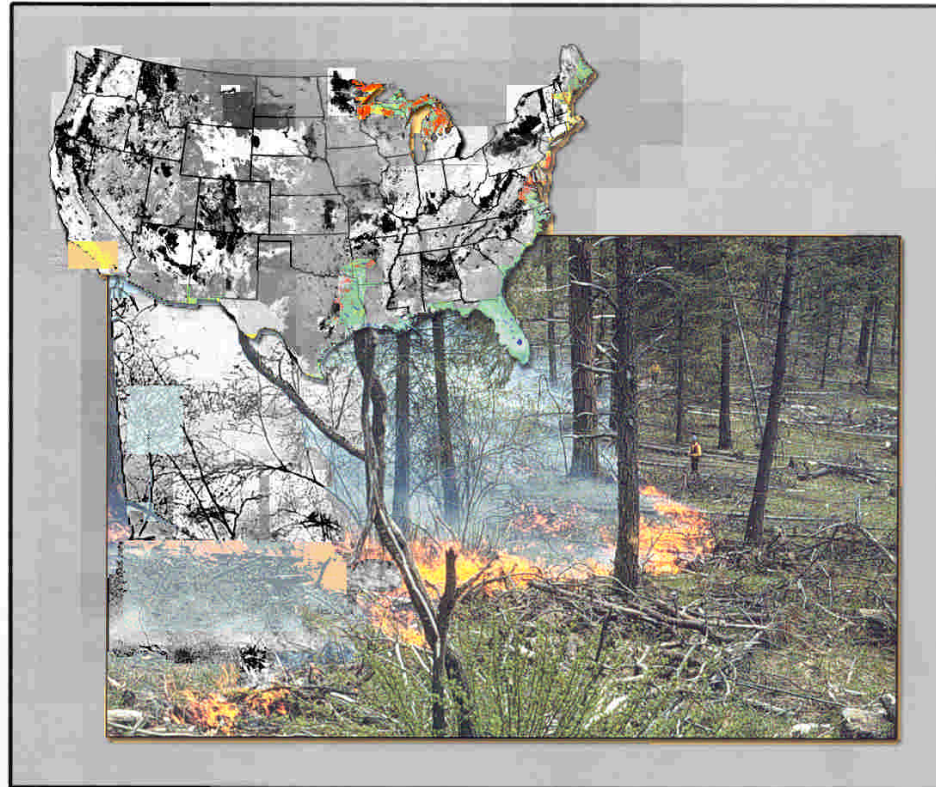
Kirsten M. Schmidt

James P. Menakis

Colin C. Hardy

Wendel J. Hann

David L. Bunnell



8 Continental Fire Regimes Bud Heinzelman (1978)

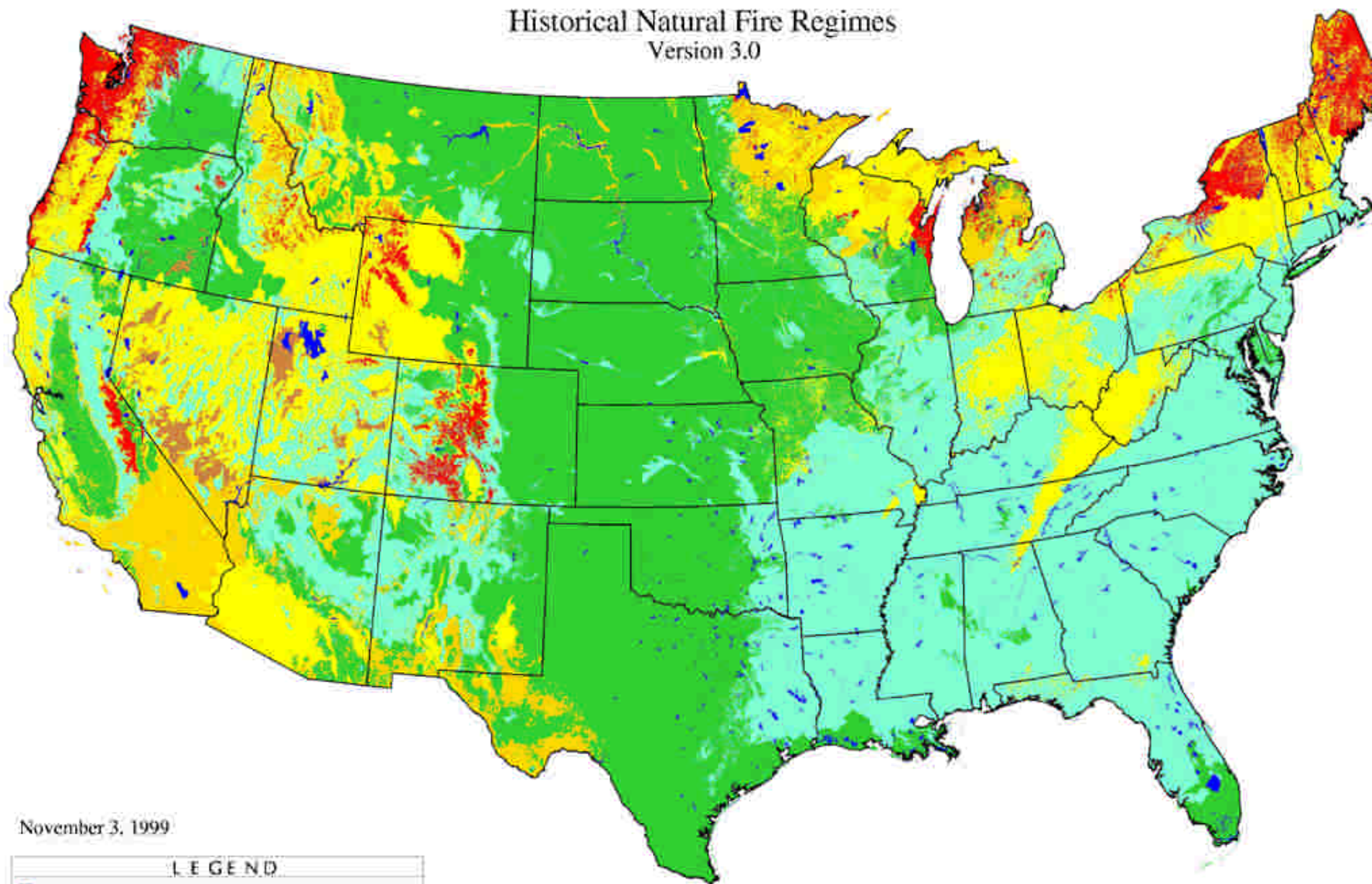


5 Fire Regime Groups

1. 0 - 35 year frequency, non-lethal severity (longneedle pines)
2. 0 - 35 year frequency, stand replacement severity (grass/shrub) (mountain shrub)
3. 35 - 100 year frequency, mixed severity
4. 35 - 100 year frequency, stand replacement severity (Boreal Forest - LPP)
5. 200 + year frequency, stand replacement severity (Sub Alpine types)



Historical Natural Fire Regimes Version 3.0



November 3, 1999

LEGEND

- I: 0 - 35 yr. frequency, Low Severity
- II: 0 - 35 yr. frequency, Stand Replacement Severity
- III: 35 - 100+ yr. frequency, Mixed Severity
- IV: 35 - 100+ yr. frequency, Stand Replacement Severity
- V: 200+ yr. frequency, Stand Replacement Severity
- VI: Barren

FEDERAL AGENCY OWNERSHIP ACRES BY

Figures Calculated in Millions & Thousands

Fire Region Group	CC1	CC2	CC3	Total Acres
1	38,550	58,738	35,284	132,572
2	23,797	31,326	725	55,850
3	77,596	52,312	21,085	150,993
4	29,198	10,271	17,096	56,565
5	23,533	3,140	390	27,064
TOTAL	192,674	155,787	74,582	423,043

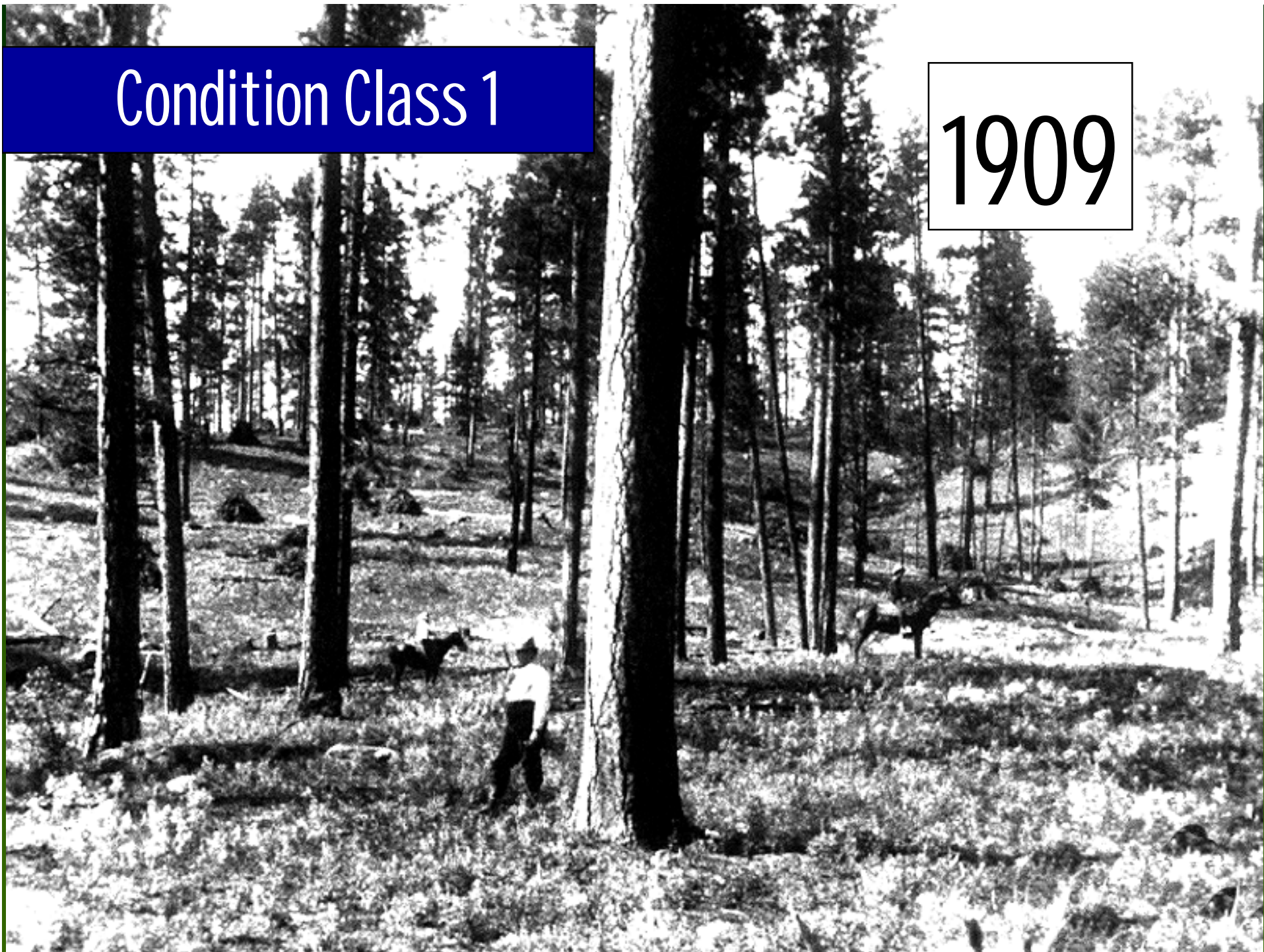
Condition Class Estimation of Fire Group 1

Condition Class	Risk to Loss		
	Low	Moderate	High
1	75	20	5
2	50	25	25
3	20	30	50

Condition Class	Risk to Loss		
	Low	Moderate	High
	1	7	2
	5	0	5

Condition Class 1

1909

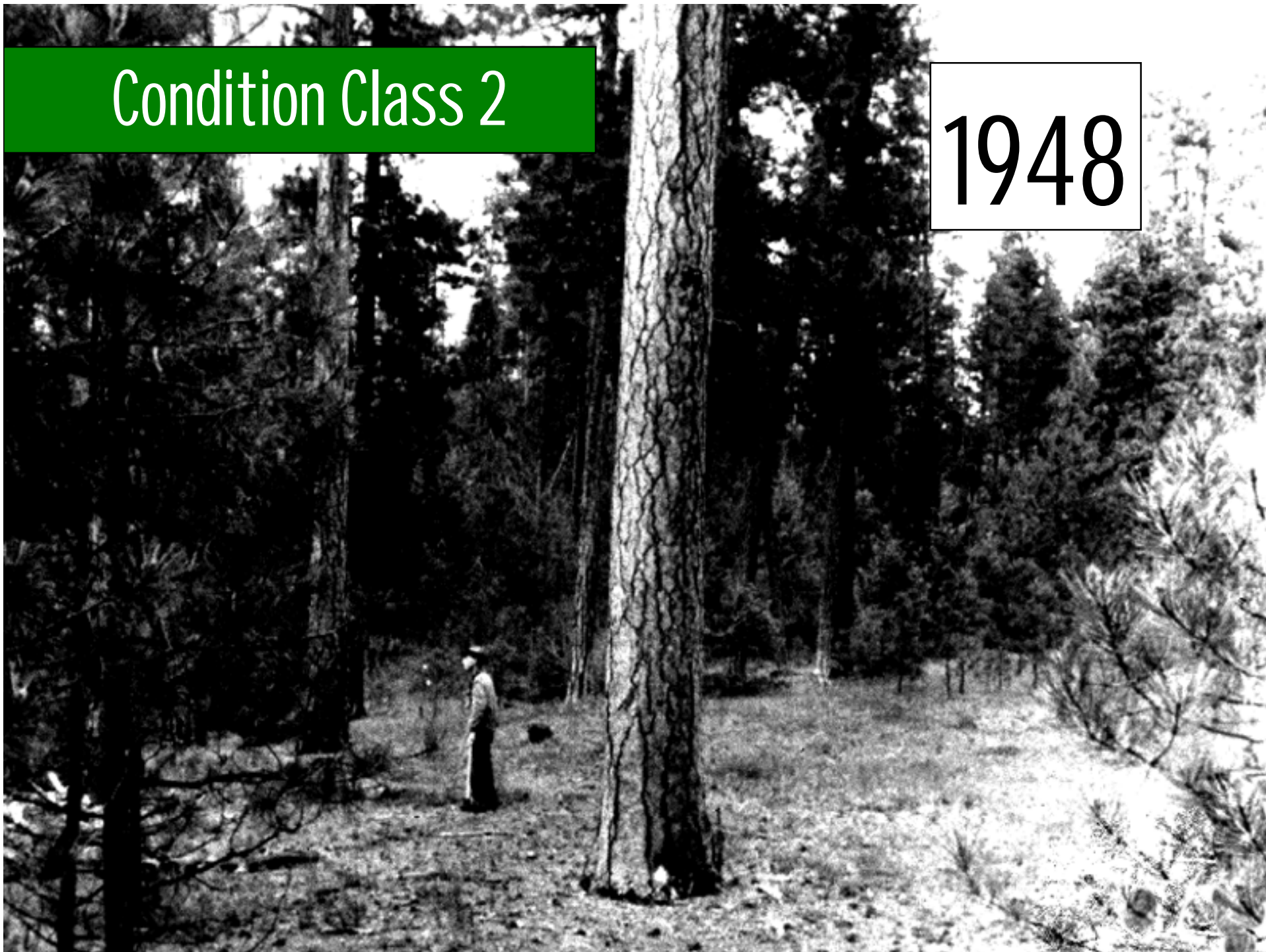


Condition Class Estimation of Fire Group 1

Condition Class	Risk to Loss		
	Low	Moderate	High
1	7	2	5
	5	0	
2	5	2	2
	0	5	5

Condition Class 2

1948



Condition Class Estimation of Fire Group 1

Condition Class	Risk to Loss		
	Low	Moderate	High
1	75	20	5
2	50	25	25
3	20	30	50

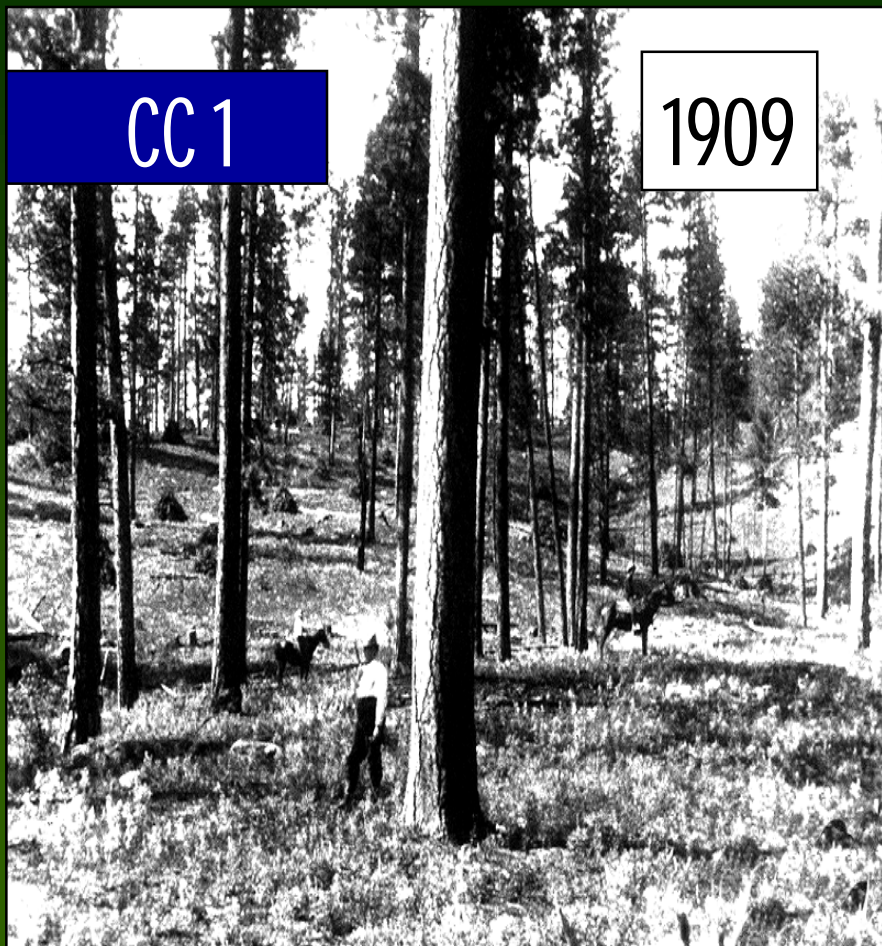
Condition Class 3

1979



CC 1

1909



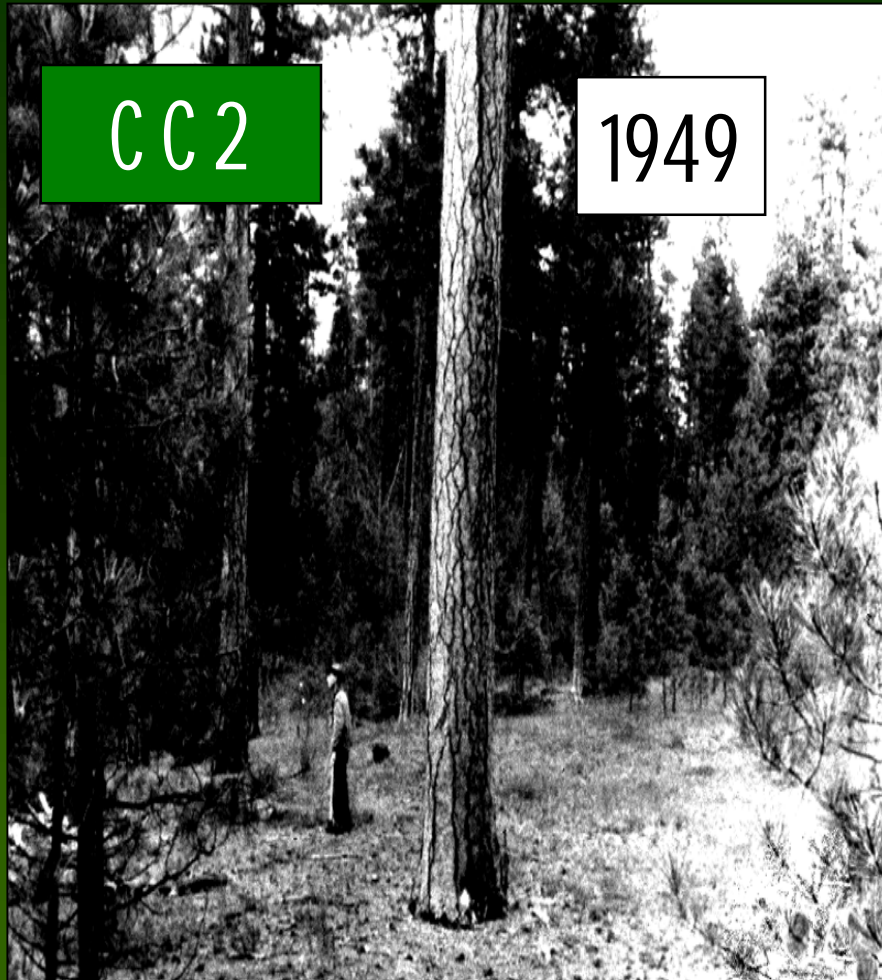
CC 2

1948



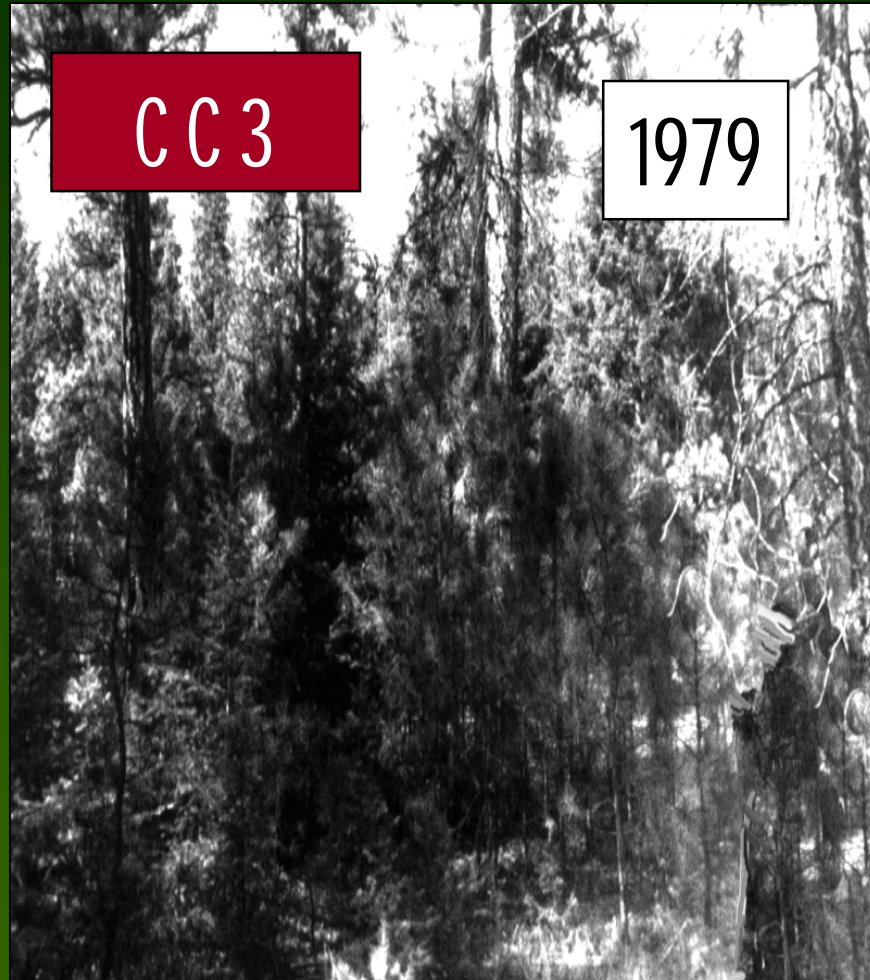
CC 2

1949



CC 3

1979



Condition Class Estimation of Fire Group 1

Condition Class	Risk to Loss			
	Low	Moderate	High	
<div>RX Fire WFU</div>	1	75	20	5
<div>RX Fire Mechanical WFU</div>	2	50	25	25
<div>Mechanical RX Fire WFU</div>	3	20	30	50

What Have We Done?



PRESCRIBED FIRE TREND

1997-2002

Figures Calculated in Millions & Thousands

Agency	1997	1998	1999	2000	2001	2002	Total
BLM	73	200	245	120	34	313	985
BIA	37	48	93	106	21	121	426
NPS	70	86	135	53	98	164	512
FWS	324	286	301	201	140	454	1,706
USFS	1,098	1,489	1,412	772	1,320	1,234	7,326
TOTAL	1,602	2,109	2,186	1,252	1,613	2,286	11,048

Prescribed Fire Program in F.S. Wilderness

<u>Region</u>	<u>Year</u>	<u>#Acres</u>
8	1994	2,760
8	1995	4,980
8	1996	7,582
6	1996	1,000
8	1997	3,940
6	1997	400
8	1998	6,130
6	1998	500
8	1999	5,045
6	1999	1,000
		<u>33,337</u>

1970 - 2002 WFU PROGRAM SUMMARY

	<u># Fires</u>	<u># Acres</u>
NPS	2,761	386,438
USFS	1,594	614,336
Other Ag.	<u>118</u>	<u>15,076</u>
Totals	4,473	1,015,850

USFS WFU TREND

1996-2001

<u>Region</u>	<u># WFU</u>	<u># Acres</u>
1	244	95,003
2	23	1,451
3	85	62,180
4	139	52,768
5	45	3,573
6	13	13,122
9	6	4,828
Totals	<u>555</u>	<u>232,924</u>

USFS WFU SUMMARY 1972-2001

<u>Region</u>	<u># Fires</u>	<u># Acres</u>
1	744	312,168
2	23	1,451
3	440	159,893
4	296	109,419
5	51	4,353
6	11	1,038
9	38	5,241
Totals	<u>1,603</u>	<u>593,563</u>

USFS WFU 2001

<u>Region</u>	<u># Fires</u>	<u># Acres</u>
1	59	28,185
2	14	963
3	23	8,062
4	4	521
5	12	254
6	3	7
8	0	0
9	0	0
Totals	<u>115</u>	<u>37,992</u>

Can We Do More?

- Money and people
- Additional skills
- Integration with/LRMP
- Fire use education
- Increased risk acceptance
- Community based collaboration
- Agency and social culture

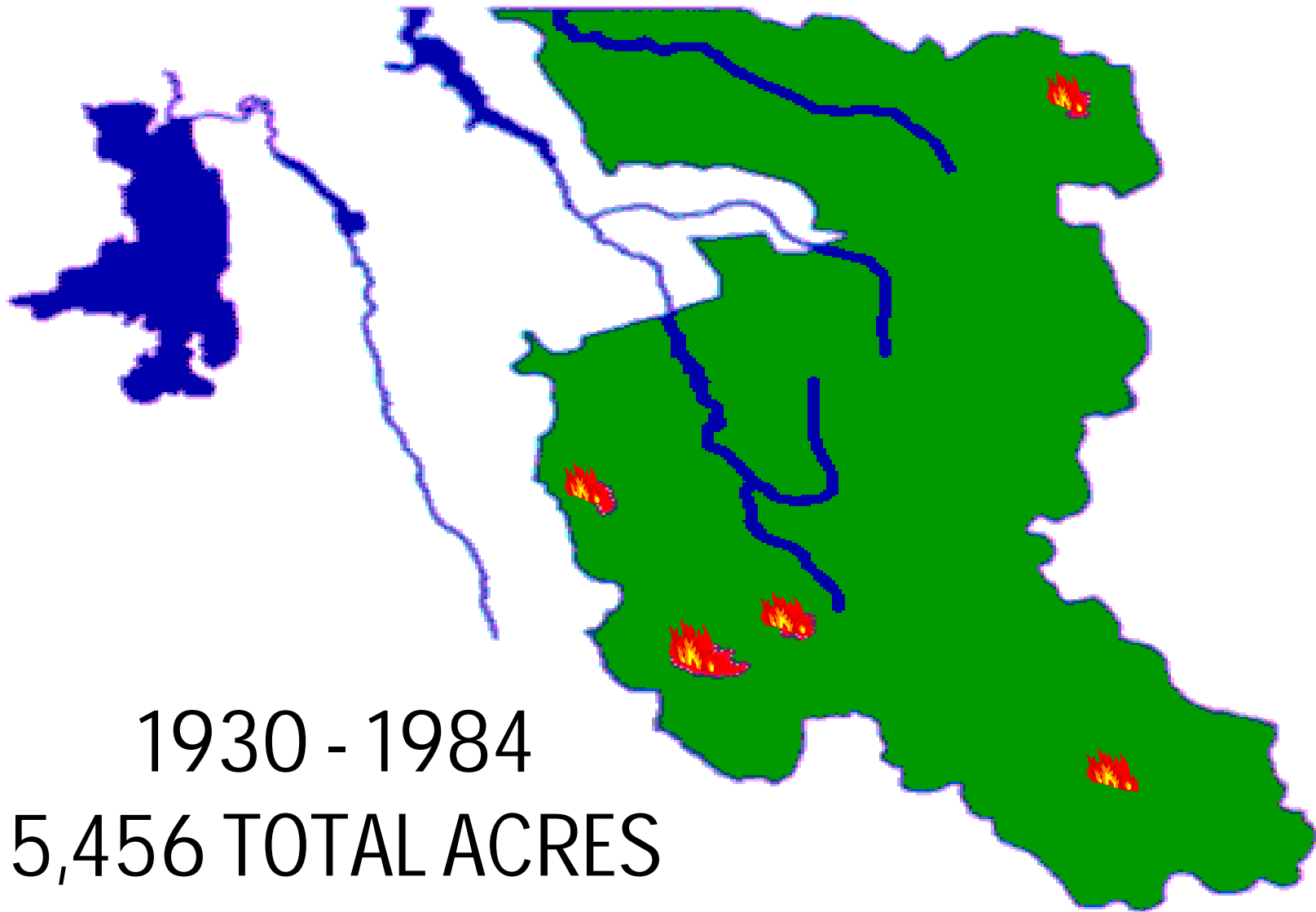
1998 R-1 AMR to Wilderness Fire Occurrence

- PNF's
 - 57 for 26,385 AC.
- Wildland Fires
 - Control 44 for 810 AC
 - Confine 5 for 2,985 AC
- 106 fires - 54% PNF, 42% Control, 4% confine

Program "Story"

2000-2002 Fire Seasons

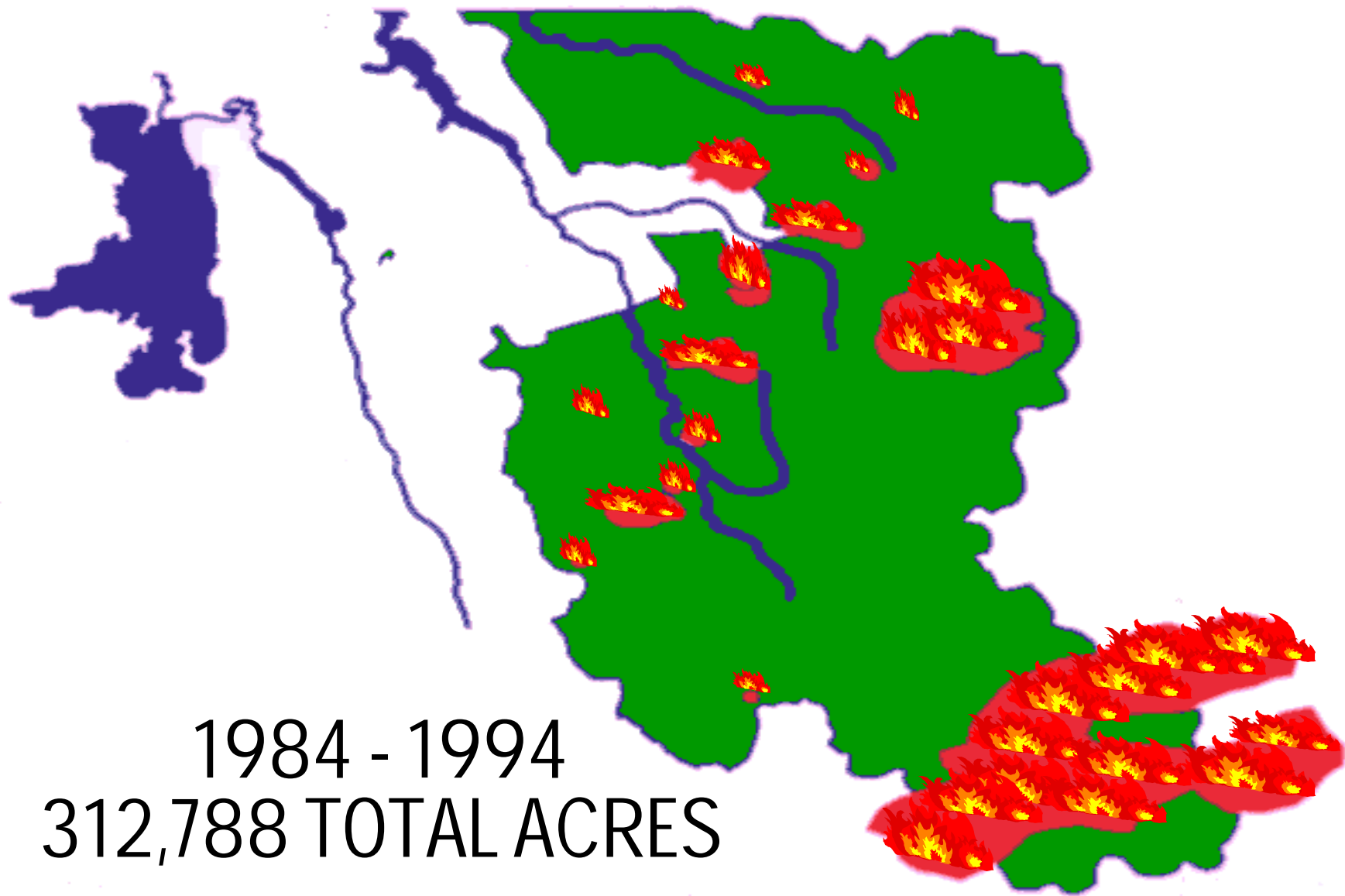
- Consequences
- Influence of past management decisions



1930 - 1984

5,456 TOTAL ACRES

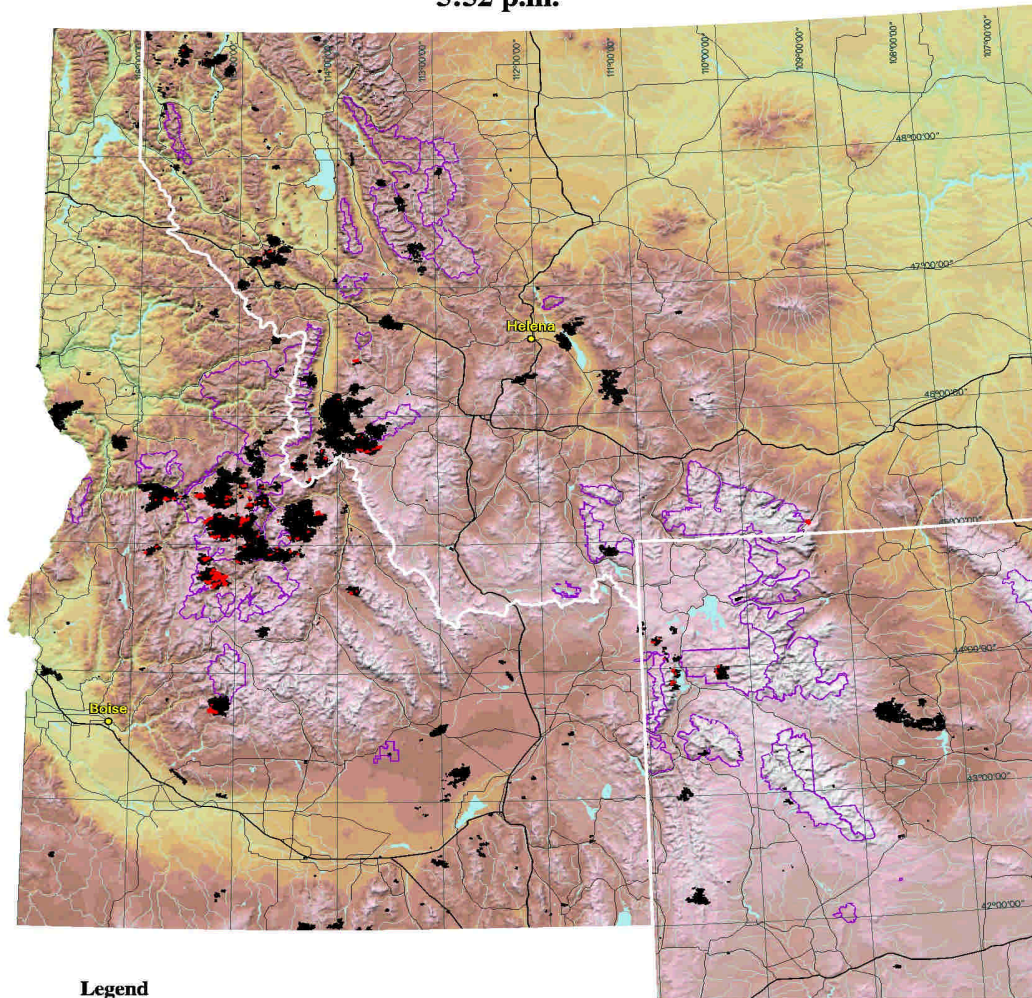
***BOB MARSHALL WILDERNESS
AMR TO WILDLAND OCCURRENCE***



***BOB MARSHALL WILDERNESS - AMR
TO WILDLAND FIRE OCCURRENCE***

INTERAGENCY FIRE MAP

Cumulative Fire Spread for Idaho, Western Montana, and Western Wyoming From July 4, 2000 to August 27, 2000 5:52 p.m.



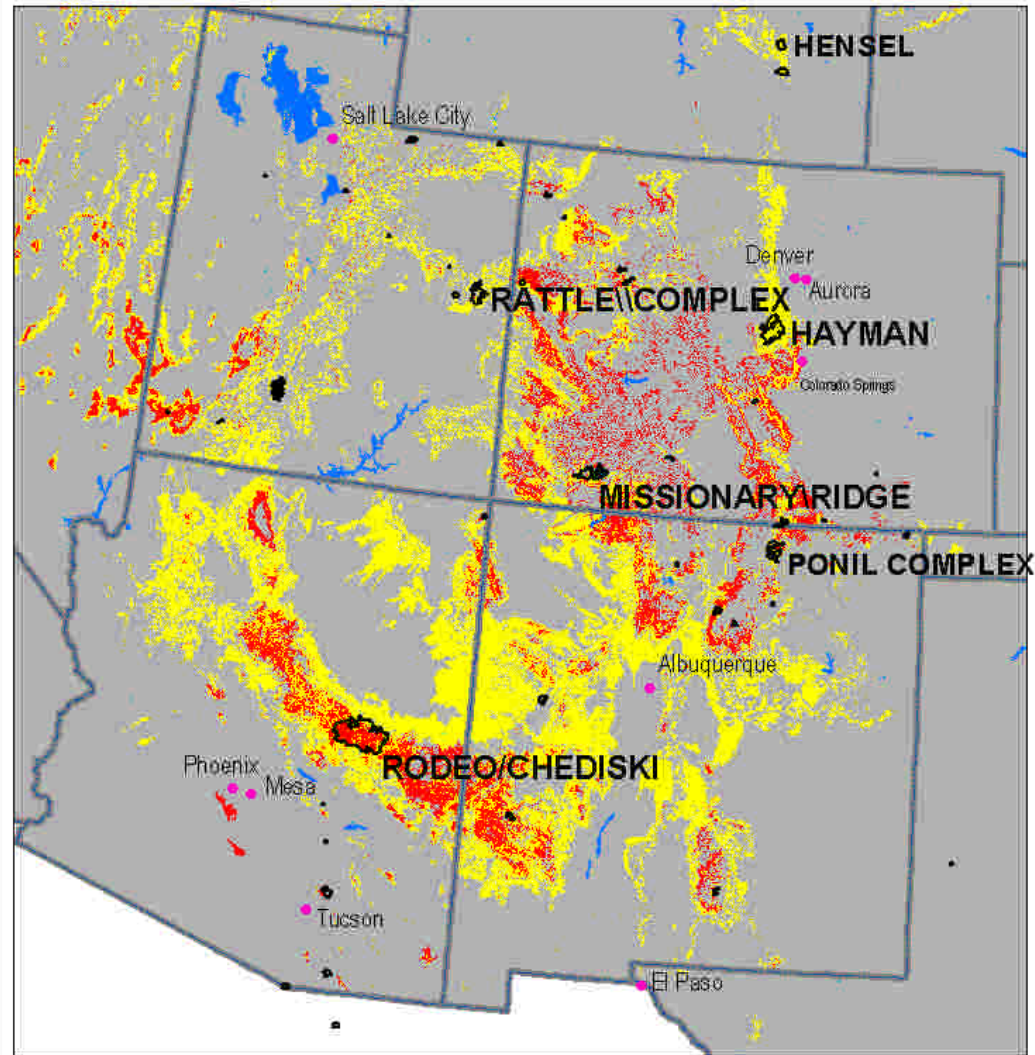
Legend

- Active Burning (High Sensor Temperatures at Time of most recent Satellite pass).
- Previous Burn Areas (Areas of High Sensor Temperature taken from preceding Satellite Passes). Does not indicate ground fires are extinguished.
- Lakes and Water Bodies
- State Capitals
- Interstate Highways
- Major Roads
- Wilderness Areas
- Latitude / Longitude



Prepared by:
USDA Forest Service Region 4 GIS, Ogden Utah
Fires mapped using AVHRR Tyros Satellites
NOAA 12 and NOAA 14
Data approximation varies from one to two kilometers.

Large Fire Locations by Fire Regime Condition Classes 2 & 3 for Historical Natural Fire Regimes I



Legend

Large Fire Perimeters -- July 2, 2002

Fire Regime Condition Class

Condition Class 2

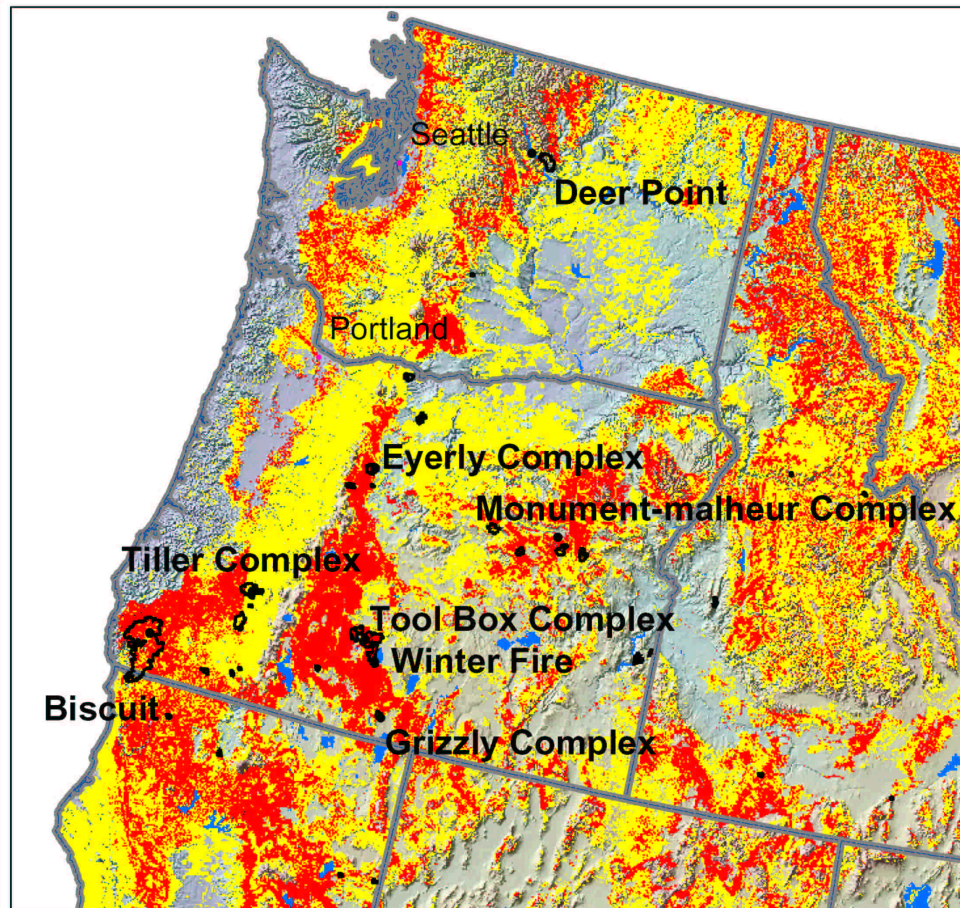
Condition Class 3

SOURCES

Fire Perimeters - MODIS Satellite Imagery (Total number of fires from Jan 1st to present).
Provided by RSAC, USDA FS

Fire Regime Info - Fire Science Lab, RMRS, USDA FS


Large Fire Locations by Fire Regime Condition Classes 2 & 3 for All Historical Natural Fire Regimes



Legend

 Large Fire Perimeters -- Aug 16, 2002

Fire Regime Condition Class

 Condition Class 2

 Condition Class 3

SOURCES

Fire Perimeters: MODIS Satellite Imagery
(Total number of fires from Jan 1st to present).
Provided by RSAC, USDA FS
Fire Regime Condition Classes: Fire Science Lab,
RMRS, USDA FS

Fire Regime Condition Class 1

For the most part, fire regimes in this Fire Regime Condition Class are within historical ranges. Thus, the risk of losing key ecosystem components from the occurrence of fire remains relatively low. Maintenance management such as prescribed fire, mechanical treatments, or preventing the invasion of non-native weeds, is required to prevent these lands from becoming degraded.



Fire Regime Condition Class 2

Fire regimes on these lands have been moderately altered from their historical range by either increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified in these lands. To restore these lands, to their historical fire regimes, may require some level of restoration through prescribed fire, mechanical or chemical treatments, and the subsequent reintroduction of native plants.

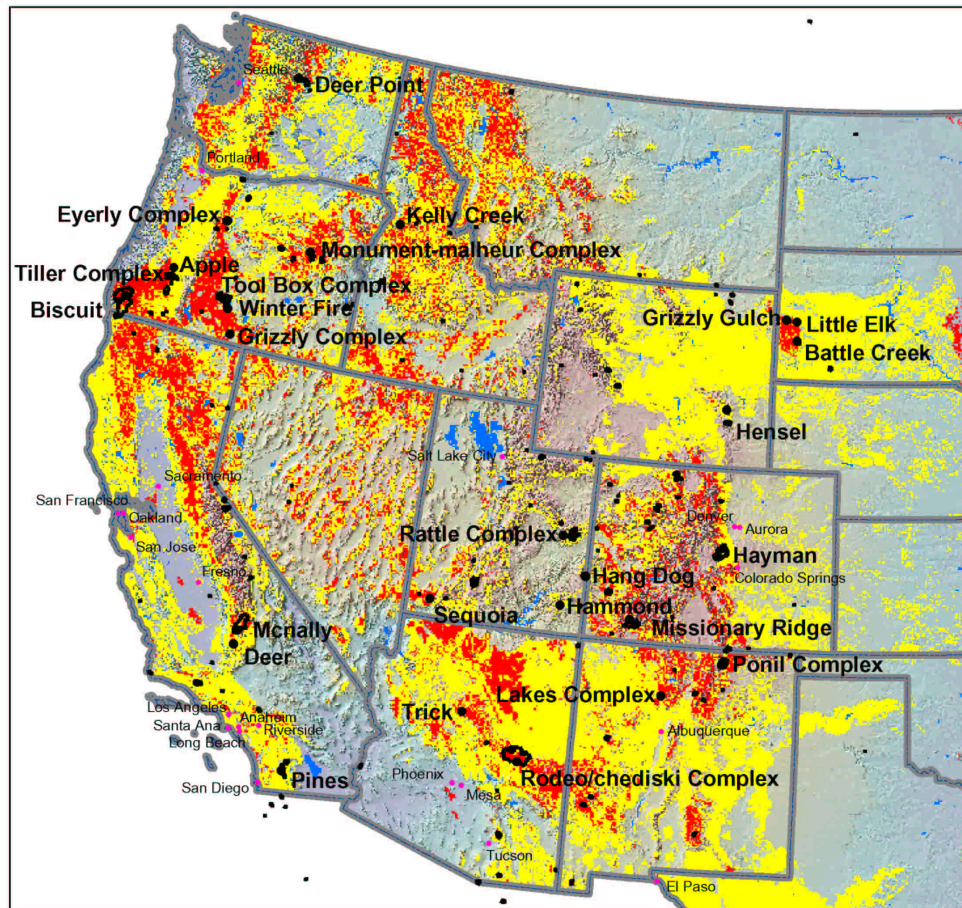


Fire Regime Condition Class 3

These lands have been significantly altered from their historical range. Because fire regimes have been extensively altered, risk of losing key ecosystem components from fire is high. Consequently, these lands verge on the greatest risk of ecological collapse. To restore these lands, to their historical fire regimes, may require multiple mechanical or chemical treatments and reseeding before prescribed fire can be utilized to manage fuel or obtain other desired benefits.



Large Fire Locations by Fire Regime Condition Classes 2 & 3 for All Historical Natural Fire Regimes



Legend

Large Fire Perimeters -- Aug 30, 2002

Fire Regime Condition Class

Condition Class 2

Condition Class 3

SOURCES

Fire Perimeters: MODIS Satellite Imagery
(Total number of fires from Jan 1st to present).
Provided by RSAC, USDA FS
Fire Regime Condition Classes: Fire Science Lab,
RMRS, USDA FS

Fire Regime Condition Class 1

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2002 – CC 2 & 3 Expenses

- \$350 mm
- 80,000 Families
- 290 Homes
- 70% Focus



The diagram illustrates a fire cycle. At the bottom, a brown rectangular box with a wood-grain texture contains the text "Land Managers". Two vertical yellow lines extend upwards from the box, passing through a large fire. The fire is depicted with bright yellow and orange flames at its base, transitioning to red at the tips. Behind the fire are several green coniferous trees. Above the trees, two large, light blue curved arrows form a continuous loop. The left arrow points from the fire area towards the left, and the right arrow points from the left towards the fire area. Two yellow lines follow the path of these arrows, starting from the top left, curving around the top, and ending near the fire, suggesting a process or cycle.

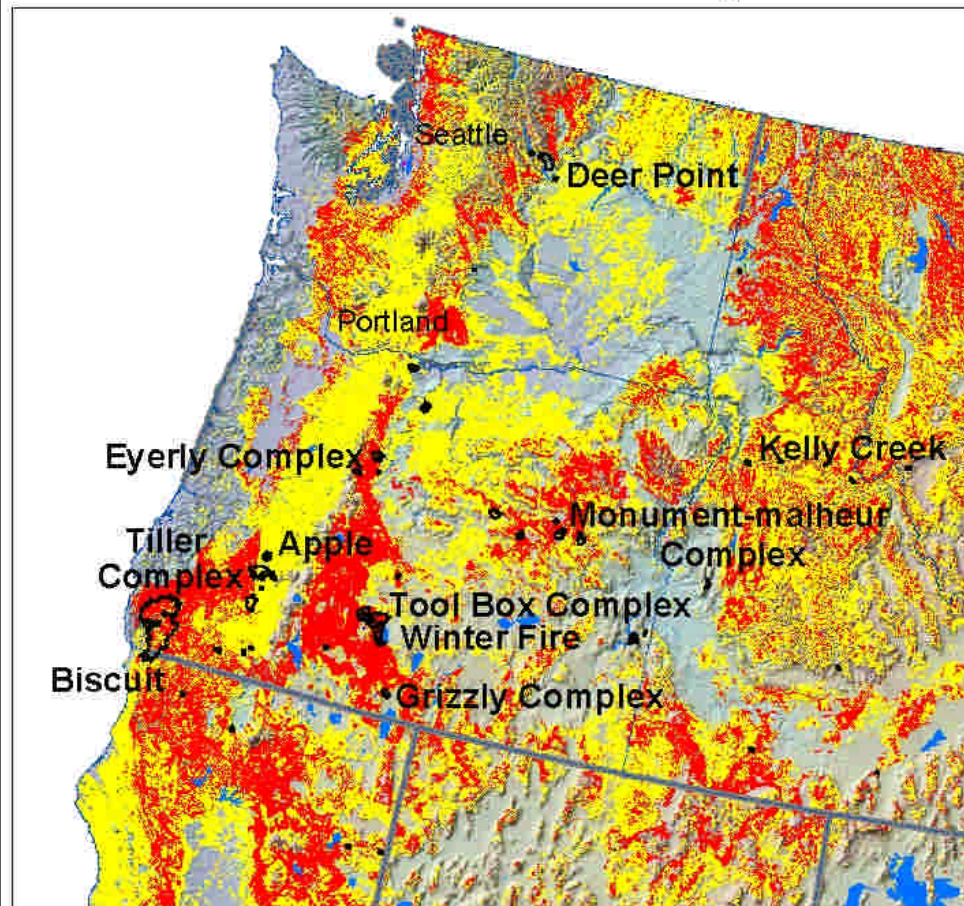
Land Managers

Ultimately the
Agency
Administrator must
say YES or NO!



Provide our best
decision input based
on experience and
science.

Large Fire Locations by Fire Regime Condition Classes 2 & 3 for All Historical Natural Fire Regimes



Legend

Large Fire Perimeters -- Aug 30, 2002

Fire Regime Condition Class

Condition Class 2

Condition Class 3

SOURCES

Fire Perimeters: MODIS Satellite Imagery
(Total number of fires from Jan 1 to present)
Provided by RSAC, USDAFS
Fire Regime Condition Classes: Fire Science Lab,
RMRS, USDAFS

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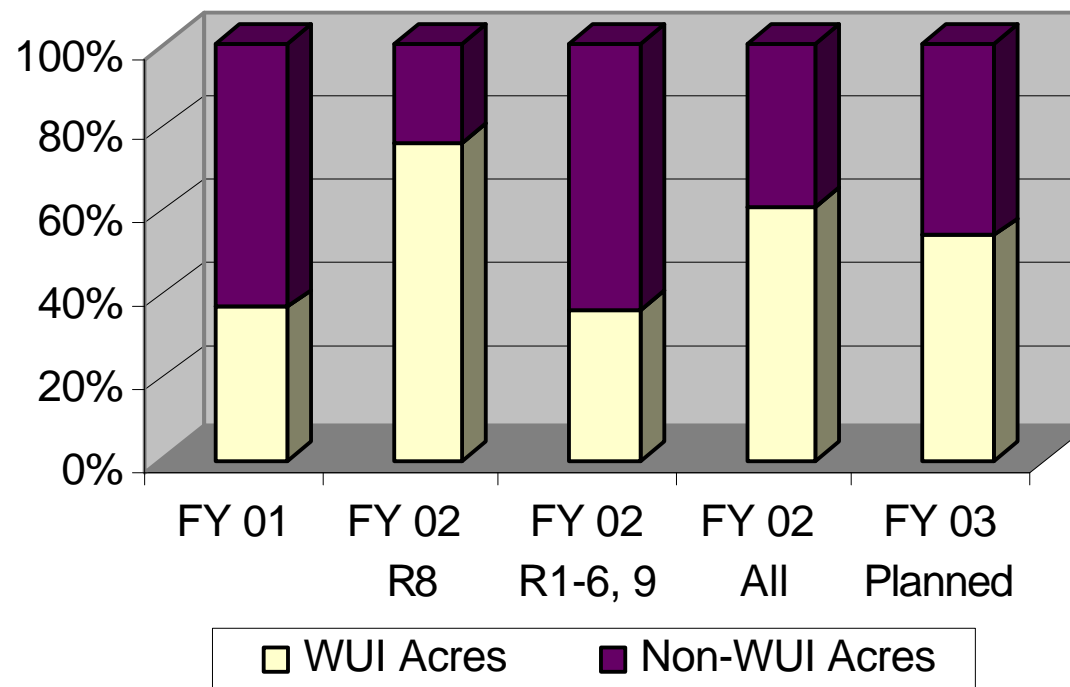


Fire Regime Condition Class 3

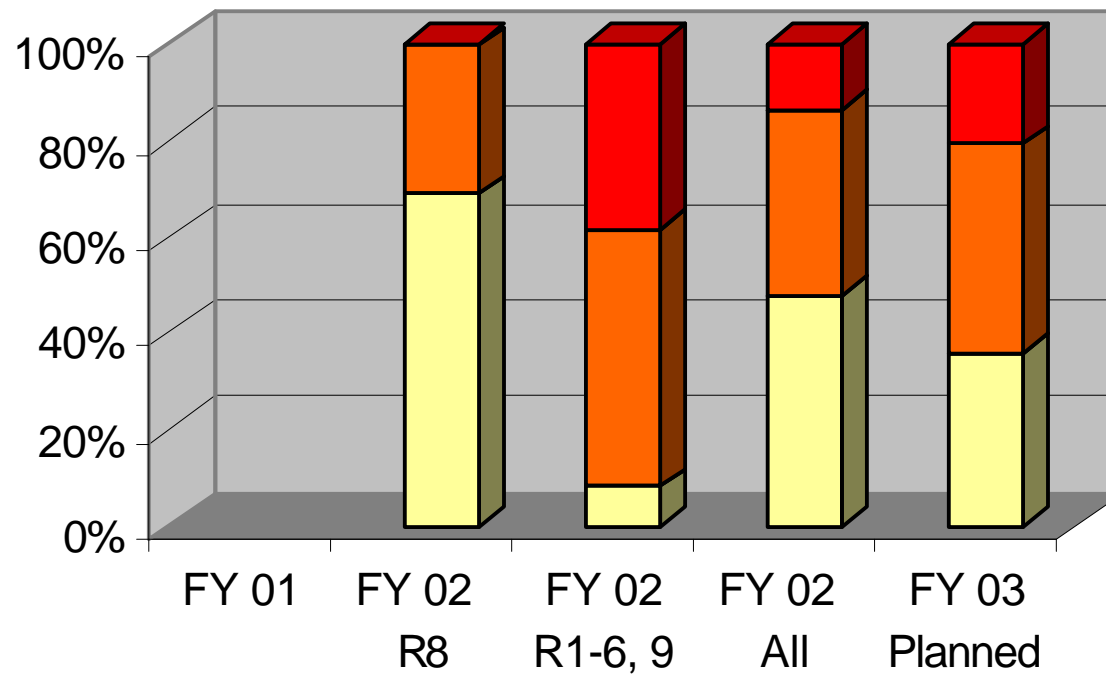
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WUI vs Non-WUI (Acres)



Condition Class (Acres)



Condition Class 1 Acres
Condition Class 3 Acres

Condition Class 2 Acres

2002 Summary

Fire Regime Group 1 Fires

- 36 Large Fires > 1000 Acres
- 1,491,000 Acres Burned
- 31,000 Resources Committed
- 46,000 Residence Evacuations
- 1,269 Structures Lost
- \$364mm Suppression Expense

Uncalculated Collateral Damage & Loss

- Replacement cost of structural loss
- Damage to natural resources – PP stand replacement loss
- Loss of watershed retention & watershed run-off
- Costs associated with long-term evacuations
- Costs to RED CROSS & FEMA
- Business loss during period of suppression
- Cost of long-term fire areas rehab
- Long-term loss of business revenue – altered landscape

Rx Fire Trend 1997 - 2002

AGENCY	ACRES/YEAR						
	1997	1998	1999	2000	2001	2002	TOTAL
BLM	72,500	200,223	245,000	120,000	34,000	313,429	985,152
BIA	37,000	48,287	92,849	106,322	21,256	120,761	426,475
NPS	30,000	86,126	135,441	52,809	97,691	163,511	605,578
FWS	324,000	285,758	300,508	201,052	140,008	453,603	1,704,929
USFS	1,097,658	1,489,293	1,412,281	772,374	1,319,934	1,234,315	7,325,855
TOTAL	1,601,158	2,109,687	2,186,079	1,252,557	1,612,889	2,285,619	11,047,989